

T-41-69

IS435/IS436 Built-in Amp. Type Light Detector

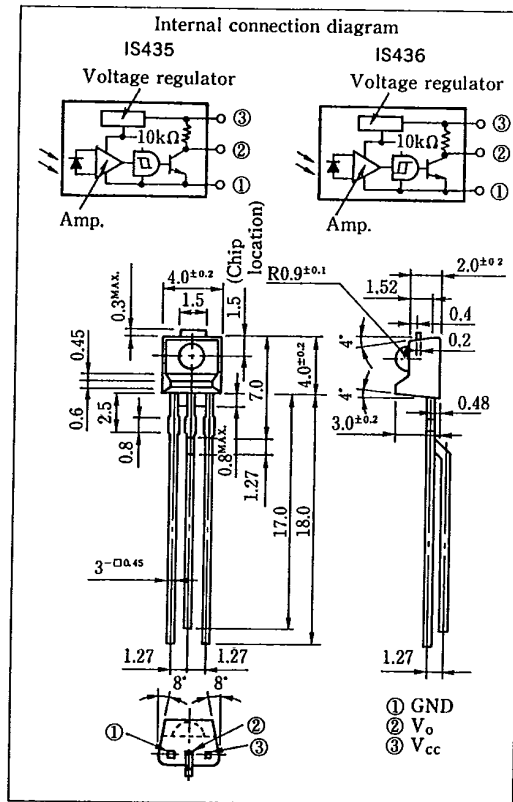
Features

1. Built-in Schmidt trigger circuit
2. High Sensitivity (E_v : MAX. 35 lx at $T_a = 25^\circ\text{C}$)
3. A wide range of operating supply voltages (V_{cc} : 4.5~17V)
4. LSTTL and TTL compatible output.
5. Low level output under incident light (IS435)
 High level output under incident light (IS436)

Applications

1. Floppy disk drives
2. Copiers, printers, facsimiles
3. VCRs, cassette decks
4. Automatic vending machines

Outline Dimensions (Unit : mm)



*OPIC is a registered trademark of Sharp and stands for Optical IC. It has a light detecting element and signal processing circuitry integrated onto a single chip.

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{cc}	-0.5~+17	V
Output current	I_o	50	mA
Power dissipation	P	250	mW
Operating temperature	T_{opr}	-25~+85	$^\circ\text{C}$
Storage temperature	T_{stg}	-40~+100	$^\circ\text{C}$
*1 Soldering temperature	T_{sol}	260	$^\circ\text{C}$

*1 For 5 seconds at the position of 2.5mm from the bottom face of resin package.

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Electro-optical Characteristics

(Unless otherwise specified, Ta=0~+70°C, Vcc=5V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit		
Low level output voltage	V _{OL}	I _{OL} = 16mA *2	—	0.15	0.4	V		
High level output voltage	V _{OH}	*3	3.5	—	—	V		
Low level supply current	I _{CCL}	*2	—	2.5	5.0	mA		
High level supply current	I _{CCH}	*3	—	1.0	3.0	mA		
**“High”→“Low” threshold illuminance	IS435	E _{VHL}	Ta=25°C	—	15	35	lx	
			—	—	—	50		
	IS436	Ta=25°C	1.5	10	—			
**“Low”→“High” threshold illuminance	IS435	E _{VLH}	Ta=25°C	1.5	10	—	lx	
			—	1	—	—		
	IS436	Ta=25°C	—	15	35			
**Hysteresis	IS435	E _{VLH} /E _{VHL}	Ta=25°C	0.50	0.65	0.90	—	
	IS436	E _{VHL} /E _{VLH}						
Response time	“High”→“Low” propagation time	IS435	Ta=25°C EV=50lx RL=280Ω	t _{PHL}	—	3	9	μs
		IS436			—	5	15	
	“Low”→“High” propagation time	IS435			—	5	15	
		IS436			—	3	9	
	Rise time	t _r			—	0.1	0.5	
	Fall time	t _f			—	0.05	0.5	

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- *2 Defines Ev=50 lx (IS435) and Ev=0 (IS436).
- *3 Defines Ev=0 (IS435) and Ev=50 lx (IS436).
- *4 E_{VHL} represents illuminance by CIE standard light source A (tungsten lamp) when output goes from high to low.
- *5 E_{VLH} represents illuminance by CIE standard light source A (tungsten lamp) when output goes from low to high.
- *6 Hysteresis stands for E_{VLH}/E_{VHL} (IS435) and E_{VHL}/E_{VLH} (IS436).

Recommended Operating Conditions

(Ta=0~+70°C)

Parameter	Symbol	MIN.	MAX.	Unit
Supply voltage	Vcc	4.5	17	V
Output current	Io	—	16	mA

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Fig. 1 Power Dissipation vs. Ambient Temperature

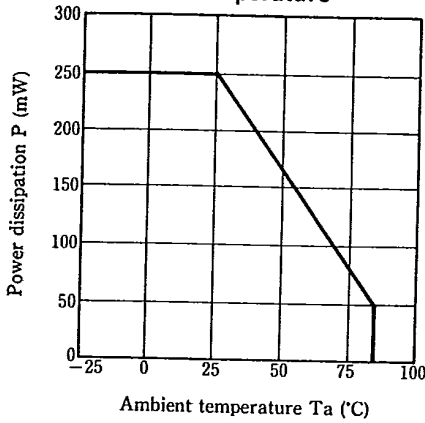


Fig. 2 Relative Threshold Illuminance vs. Supply Voltage

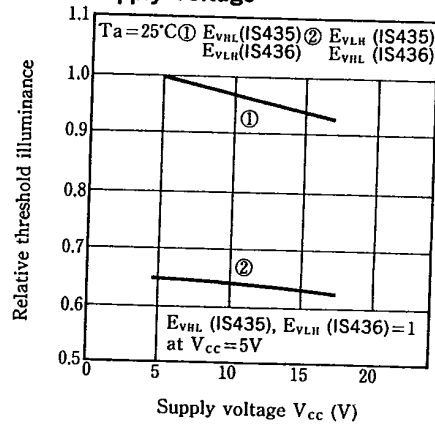


Fig. 3 Low Level Output Voltage vs. Low Level Output Current

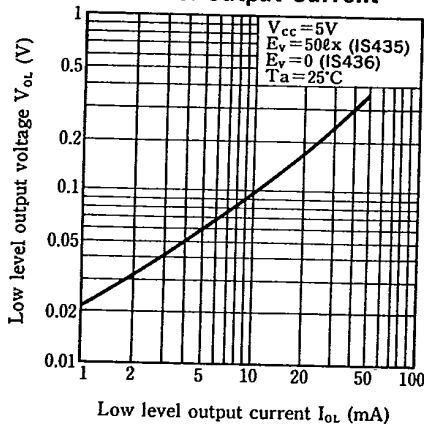


Fig. 4 Low Level Output Voltage vs. Ambient Temperature

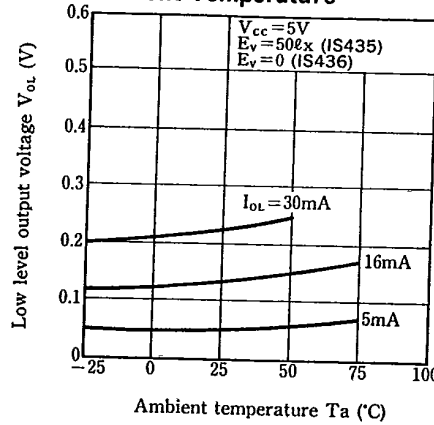


Fig. 5 Supply Current vs. Supply Voltage

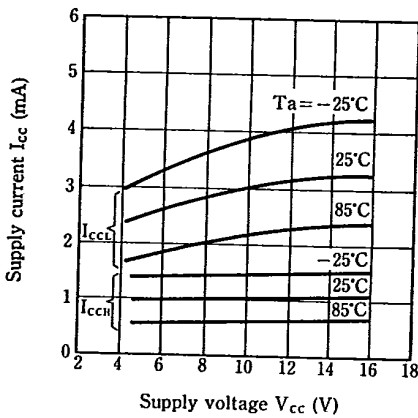


Fig. 6 Propagation Time vs. Illuminance

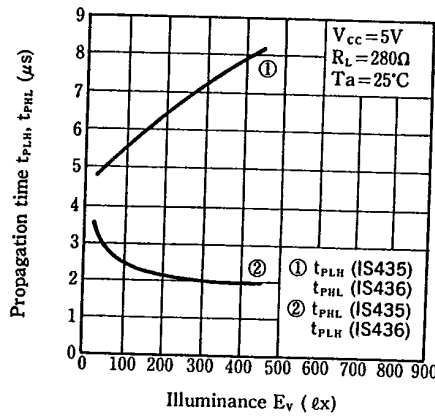
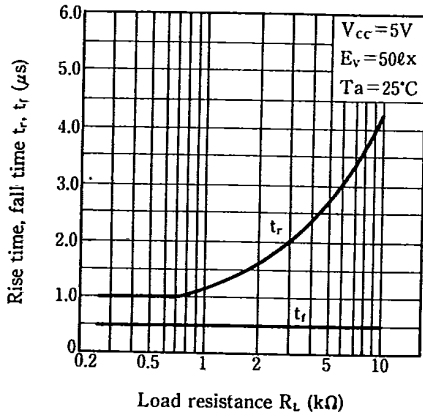
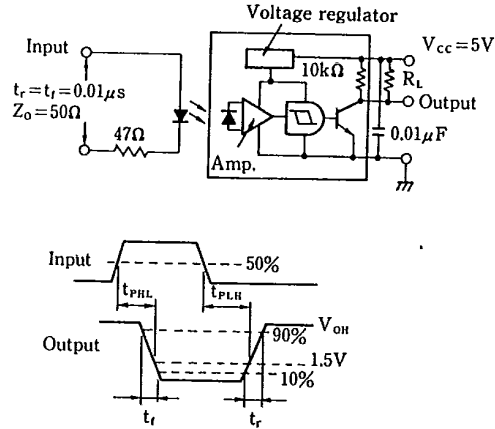


Fig. 7 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time (IS435)



Test Circuit for Response Time (IS436)

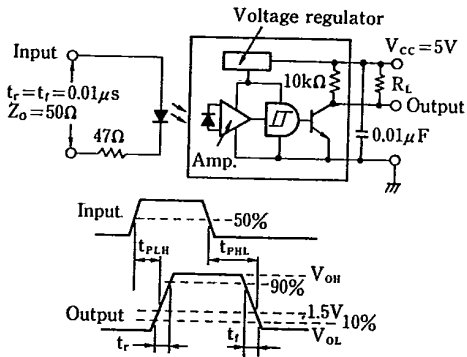
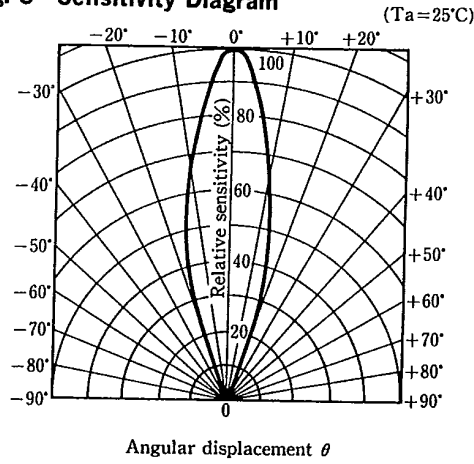


Fig. 8 Sensitivity Diagram



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Fig. 9 Spectral Sensitivity

